# TS803R

## Microprocessor Reset Circuit

SOT-23




Pin assignment
**TS803R**
1. RESET
2. Gnd
3. Vcc

**Open Drain**
**Threshold Voltage Option**
**2.7V, 2.93V, 4.2V**

## General Description

The TS803R are microprocessor (μP) supervisory circuit used to monitor the power supplies in μP and digital systems. They provide excellent circuit reliability and low cost by eliminating external components and adjustments when used with +5V, +3.3V, +3.0V powered circuits. These circuits perform a single function: they assert a reset signal whenever the VCC supply voltage declines below a preset threshold, keeping it asserted for at least 140ms after VCC has risen above the reset threshold. Reset thresholds suitable for operation with a variety of supply voltages are available. The TS803R are open –drain outputs. The TS803R have an active low RESET output, while the TS803R has an active high RESET output. The reset comparator is designed to ignore fast transients on VCC, and the output guaranteed to be in the correct logic state for VCC down to 1V. Low supply correct makes the TS803R ideal for use in portable equipment.
The TS803R is available in a 3-pin SOT-23 package.

## Features

- ✧ Precision monitoring of +3V, +3.3V and +5V power supply voltage
- ✧ Fully specified over temperature
- ✧ Available in three output configurations
- ✧ Open – Drain RESET low output
- ✧ 3uA supply current
- ✧ Guaranteed reset valid to Vcc = +1V
- ✧ Power supply transient immunity
- ✧ No external components

## Ordering Information

| Part No. | Enable Function | Threshold Voltage | Package |
|---|---|---|---|
| TS803RCX **B** | Active-Low | 4.2V | SOT-23 |
| TS803RCX **E** | Active-Low | 2.93V | |
| TS803RCX **F** | Active-Low | 2.7V | |

Note: **x** is the threshold voltage type, option as
B: 4.20V
E: 2.93V
F: 2.70V

## Applications

- ✧ Computers
- ✧ Controllers
- ✧ Intelligent instruments
- ✧ Critical uP and uC power monitoring
- ✧ Portable / Battery powered equipment
- ✧ Automotive

## Pin Descriptions

| Pin No. | Name | Description |
|---|---|---|
| 1 | RESET | Reset output pin **(Active- Low)** |
| 2 | Gnd | Ground |
| 3 | Vcc | Operating voltage input |

## Absolute Maximum Rating

| | | | |
|---|---|---|---|
| Supply Voltage | $V_{CC}$ | 7 | V |
| RESET & (RESET) push-pull | $V_{RESET}$ | - 0.3 ~ ($V_{CC}$ +0.3) | V |
| Input Current, Vcc | $I_{CC}$ | 20 | mA |
| Output Current, RESET | $I_O$ | 20 | mA |
| Rate of Rise, Vcc | $V_R$ | 100 | V/uS |

## Recommended Operating Conditions

| | | | |
|---|---|---|---|
| Supply Voltage | $V_{CC}$ | <5 | V |
| Operating Ambient Temperature Range | Ta(op) | -40 ~ +105 | $^oC$ |
| Operating Junction Temperature Range | Tj(op) | -40 ~ +125 | $^oC$ |
| Storage Temperature Range | $T_{STG}$ | -65 ~ +150 | $^oC$ |
| Thermal Resistance | Θjc | 325 | $^oC$ /W |
| Power Dissipation | $P_D$ | 350 | mW |
| Lead Soldering Temperature (260 $^oC$) | $T_{LEAD}$ | 10 | S |

## Electrical Characteristics

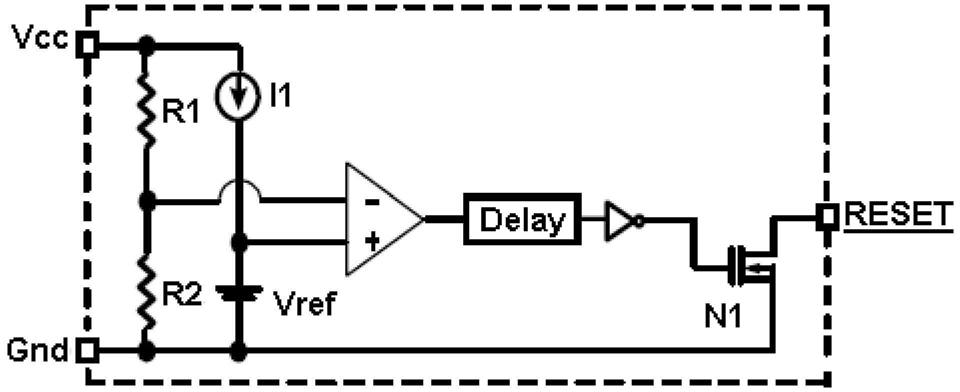
Ta = 25 $^oC$, unless otherwise specified.

| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Input Supply Voltage | Ta = 0 $^oC$ ~ +70 $^oC$ | $V_{CC}$ | 1.0 | -- | 5.5 | V |
| Supply Current | $V_{CC} \leq$ Vth * 1.1 | $I_{CC}$ | -- | -- | 3 | uA |
| | $V_{CC} \leq$ Vth * 1.1, Ta = full range | | -- | -- | 5 | |
| Reset Threshold | TS803RCX**B** | $V_{TH}$ | 0.985\|$V_{TH}$\| | 4.20 | 1.015\|$V_{TH}$\| | V |
| | TS803RCX**E** | | | 2.93 | | |
| | TS803RCX**F** | | | 2.70 | | |
| Reset Threshold (Full temperature range) | TS803RCX**B** | $V_{TH}$ | 0.97\|$V_{TH}$\| | 4.20 | 1.03\|$V_{TH}$\| | V |
| | TS803RCX**E** | | | 2.93 | | |
| | TS803RCX**F** | | | 2.70 | | |
| Reset Threshold Temperature Coefficient | | $V_{TH}$ | -- | 30 | -- | ppm/ $^oC$ |
| $V_{CC}$ to Reset Delay | $V_{CC}$ = $V_{TH}$ to ($V_{TH}$ - 100mV) | $T_{DELAY}$ | -- | 40 | -- | uS |
| Reset Active Timeout Period | Ta = 0 $^oC$ ~ +70 $^oC$ | | 0.5 | 1.5 | 5 | mS |
| RESET Output Voltage Low | $V_{CC}$ < $V_{TH(MIN)}$, $I_{SINK}$ =1.2mA, | $V_{OL}$ | -- | -- | 0.5 | V |
| RESET Output Voltage High | $V_{CC}$ > $V_{TH(MAX)}$, $I_{SOURCE}$ =500uA $V_{CC}$ > 1.8V | $V_{OH}$ | 0.8 $V_{CC}$ | -- | -- | V |
| | $V_{CC}$ > $V_{TH(MAX)}$, $I_{SOURCE}$ =150uA, 1.8V >= $V_{CC}$ > 1V | | | | | |

Note 1 : The data based on $V_{TH}$ = 2.7V part type.

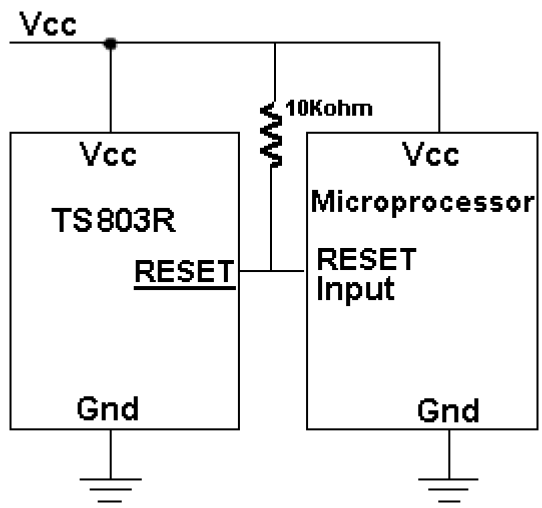
TSC

## Function Block

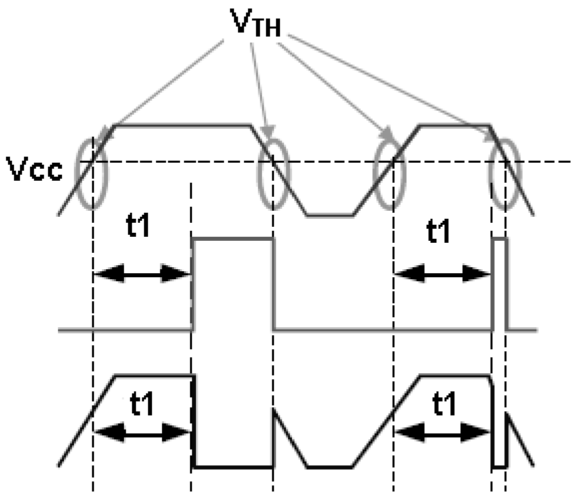



## Function Description

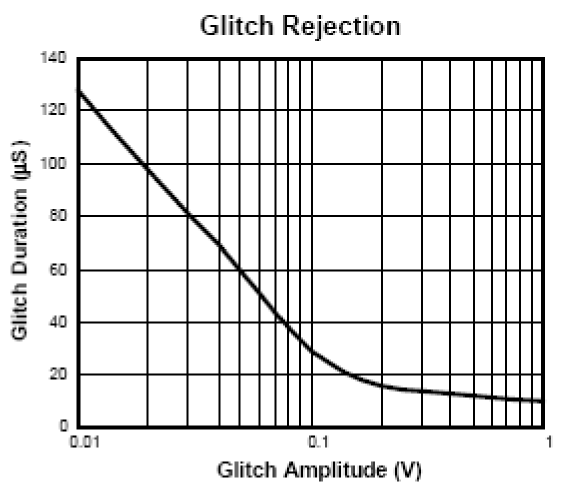
### Applications Circuit

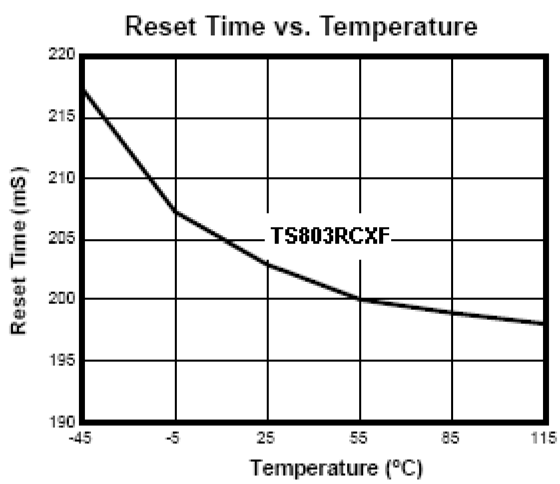



### Timing Diagram



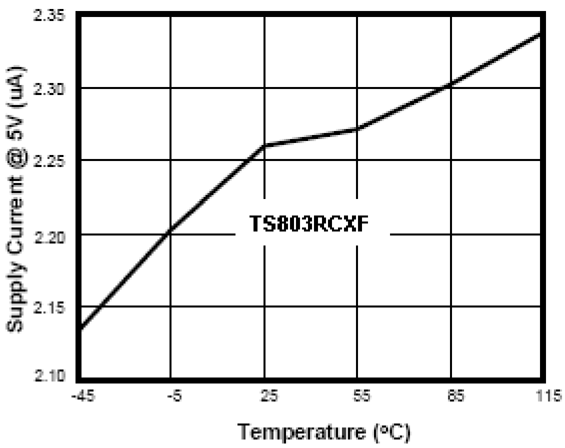

## Electrical Characteristics Curve



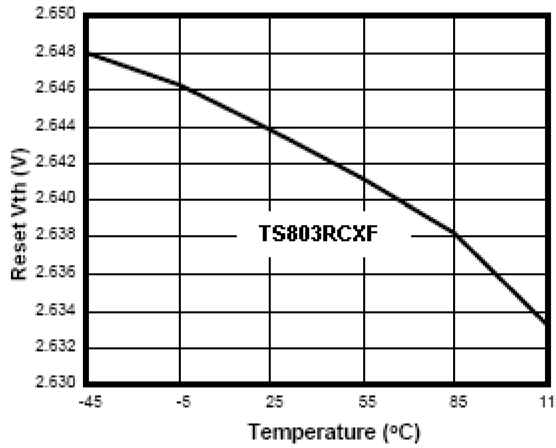



## Electrical Characteristics Curve

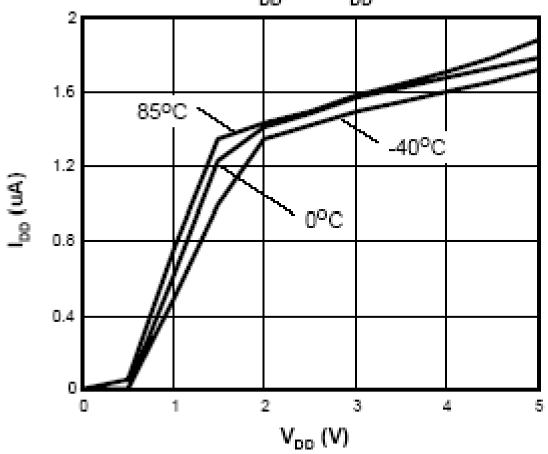
$I_{DD}$ vs. Temperature



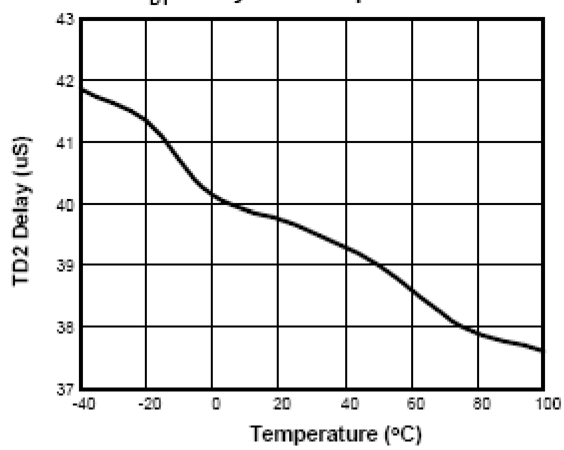

Reset $V_{TH}$ vs. Temperature



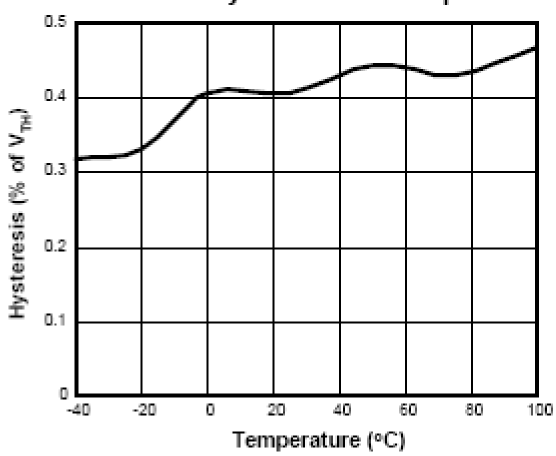

$I_{DD}$ vs. $V_{DD}$



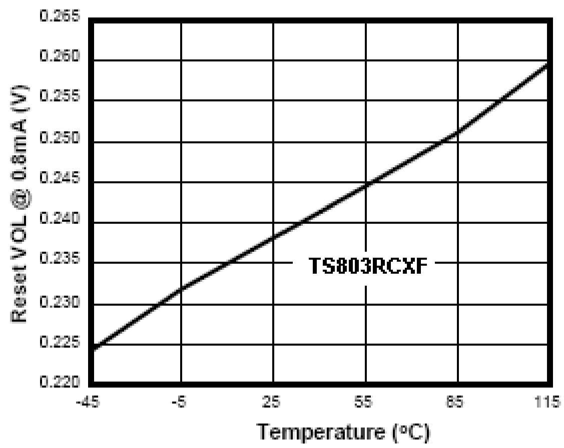

$T_{D1}$ Delay vs. Temperature



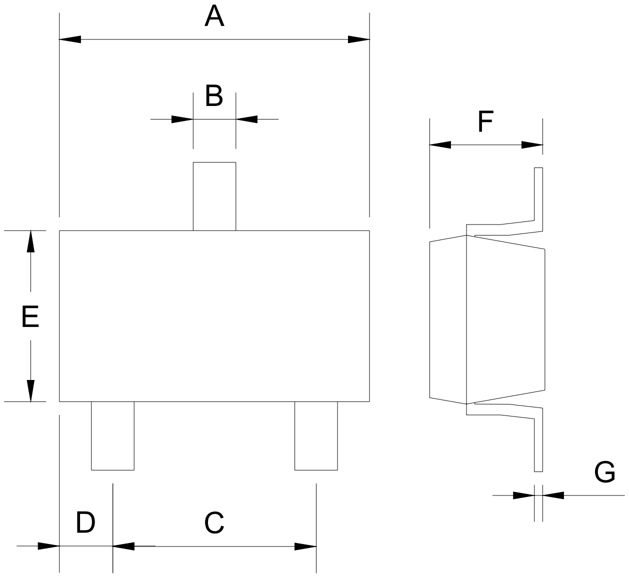

Threshold Hysteresis vs. Temperature




Reset VOL vs. Temperature



# SOT-23 Mechanical Drawing




| SOT-23 DIMENSION | | | | |
|---|---|---|---|---|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 2.88 | 2.91 | 0.113 | 0.115 |
| B | 0.39 | 0.42 | 0.015 | 0.017 |
| C | 1.78 | 2.03 | 0.070 | 0.080 |
| D | 0.51 | 0.61 | 0.020 | 0.024 |
| E | 1.59 | 1.66 | 0.063 | 0.065 |
| F | 1.04 | 1.08 | 0.041 | 0.043 |
| G | 0.07 | 0.09 | 0.003 | 0.004 |